

11 a protrusion extending from the first wall of the exhaust channel into the exhaust channel so as
12 to reduce the transverse width of the exhaust channel adjacent the protrusion; and
13 B1
C1 a magnet system having north and south magnetic poles positioned adjacent the protrusion.

1 3. (amended) A plasma chamber comprising:
2 a vacuum chamber enclosure enclosing a chamber interior;
3 an exhaust aperture through which gas can be exhausted from the chamber interior;
4 an exhaust channel extending between the chamber interior and the exhaust aperture so as to
5 provide a path for gas flow from the chamber interior to the exhaust aperture;
6 a magnet system positioned adjacent the exhaust channel; and
7 B2
8 a chuck for holding a substrate at a substrate position within the chamber interior;
9 wherein the magnet system is positioned far enough from the substrate position so that the
10 magnet system produces a magnetic field that declines from at least 100 gauss at one position in the
exhaust channel to no greater than 5 gauss at the substrate position.

1 7. (twice amended) A plasma chamber comprising:
2 a vacuum chamber enclosure enclosing a chamber interior;
3 an exhaust aperture through which gas can be exhausted from the chamber interior;
4 B3
5 an exhaust channel extending between the chamber interior and the exhaust aperture so as to
6 provide a path for gas flow from the chamber interior to the exhaust aperture;
7 a deflector positioned within the exhaust channel so as to transversely deflect a substantial
8 portion of said gas flow through the exhaust channel; and
9 a magnet system having north and south magnetic poles positioned adjacent the deflector.

1 9. (twice amended) A plasma chamber according to claim 7, wherein:
2 the north and south magnetic poles are spaced apart along said gas flow path of the exhaust
3 B4
4 channel.

1 10. (twice amended) A plasma chamber according to claim 7, wherein the magnet system produces a
2 magnetic field strong enough to block plasma from extending from the chamber interior through the
3 exhaust channel beyond the protrusion.

11. (amended) A plasma chamber according to claim 7, further comprising:

a chuck for holding a substrate at a substrate position within the chamber interior;

wherein the magnet system is positioned far enough from the substrate position so that the magnet system does not produce a magnetic field greater than 5 gauss at the substrate position.

26. (twice amended) A method of preventing plasma within a plasma chamber from extending completely through the exhaust channel of the chamber, comprising the steps of:

providing a vacuum chamber enclosure that encloses a chamber interior;

admitting a gas into the chamber interior;

providing an exhaust channel extending between the chamber interior and an exhaust aperture so as to provide a path for gas flow from the chamber interior to the exhaust aperture;

positioning a deflector within the exhaust channel so as to transversely deflect a substantial portion of said gas flow through the exhaust channel; and

creating a magnet field within the exhaust channel.

Insert new claims 32-46 as follows:

32. A plasma chamber according to claim 1, wherein the magnet system is positioned with its north and south magnetic poles within the protrusion.

33. A plasma chamber according to claim 3, wherein the magnet system produces a magnetic field of at least 100 gauss.

34. A plasma chamber according to claim 7, wherein the magnet system produces a magnetic field strong enough to block plasma from extending from the chamber interior to the exhaust aperture.

35. A plasma chamber according to claim 7, wherein the magnet system is positioned with its north and south magnetic poles within the protrusion.

36. A plasma chamber according to claim 11, wherein the magnet system produces a magnetic field of at least 100 gauss

1 37. A plasma chamber comprising:

2 a vacuum chamber enclosure enclosing a chamber interior;
3 an exhaust aperture through which gas can be exhausted from the chamber interior;
4 first and second tubular walls positioned coaxially so as to form therebetween an annular
5 exhaust channel extending between the chamber interior and the exhaust aperture;
6 a first protrusion extending from the first wall toward the second wall;
7 a second protrusion extending from the second wall toward the first wall; and
8 a magnet system having north and south magnetic poles, wherein the magnet system is
9 positioned so that the north and south magnetic poles are within the first protrusion.

1 38. A plasma chamber according to claim 37, wherein the north and south magnetic poles face the
2 second wall and are spaced apart axially.

1 39. A method of preventing plasma within a plasma chamber from extending completely through the
2 exhaust channel of the chamber, comprising the steps of:

3 36 providing a vacuum chamber enclosure that encloses a chamber interior;
4 admitting a gas into the chamber interior;
5 providing an exhaust channel through which said gas can flow from the chamber interior to the
6 exhaust aperture, wherein the exhaust channel includes at least a first wall that extends between the
7 chamber interior and an exhaust aperture;
8 providing a first protrusion that extends from the first wall of the exhaust channel into the
9 exhaust channel so as to reduce the transverse width of the exhaust channel adjacent the first
10 protrusion; and
11 creating a magnet field within the exhaust channel.

1 40. A method according to claim 39, further comprising the step of:

2 holding a substrate at a substrate position within the chamber interior;
3 wherein the creating step comprises creating said magnetic field with a strength that diminishes

4 sufficiently from the exhaust channel to the substrate position so that said magnetic field is at least 100
5 gauss at one position in the exhaust channel and is no greater than 5 gauss at the substrate position.

1 41. A method according to claim 39, wherein the step of creating a magnetic field further comprises the
2 steps of:

3 providing a magnetic system having north and south magnetic poles; and
4 positioning the magnet system so that the north and south magnetic poles are within the first
5 protrusion.

1 42. A method according to claim 41, wherein positioning step further comprises positioning the
2 magnet system so that the north and south magnetic poles are spaced apart axially.

1 43. A method according to claim 39, wherein:

2 in the step of providing an exhaust channel, the exhaust channel further includes a second wall
3 that extends between the chamber interior and the exhaust aperture;

4 the step of providing a first protrusion further comprises orienting the first protrusion so as to
5 extend from the first wall toward the second wall; and

6 the method further comprises the step of providing a second protrusion that extends from the
7 second wall toward the first wall.

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3 44. A method according to claim 43, wherein the step of creating a magnetic field further comprises the
steps of:

3 providing a magnetic system having north and south magnetic poles; and
4 positioning the magnet system so that the north and south magnetic poles are within the first
5 protrusion.

1 45. A method of preventing plasma within a plasma chamber from extending completely through the
2 exhaust channel of the chamber, comprising the steps of:

3 providing a vacuum chamber enclosure that encloses a chamber interior;
4 holding a substrate at a substrate position within the chamber interior;
5 admitting a gas into the chamber interior;

6 providing an exhaust channel through which said gas can flow from the chamber interior to the
7 exhaust aperture; and
8 creating a magnet field having a strength of at least 100 gauss at one position in the exhaust
9 channel and having a strength no greater than 5 gauss at the substrate position.

1 46. A method of preventing plasma within a plasma chamber from extending completely through the
2 exhaust channel of the chamber, comprising the steps of:

3 providing a vacuum chamber enclosure that encloses a chamber interior;

4 holding a substrate at a substrate position within the chamber interior;

5 admitting a gas into the chamber interior;

6 providing an exhaust channel through which said gas can flow from the chamber interior to the
7 exhaust aperture; and

8 creating a magnet field having a strength at one position in the exhaust channel that is great
9 enough to block plasma from extending from the chamber interior to the exhaust aperture and having a
10 strength no greater than 5 gauss at the substrate position.
